

CLAIMS

What is claimed is:

1. A filtration apparatus comprising:
 - a filtration housing having an inlet port and an outlet port, each port adapted for connection to a fluid system;
 - a first circuit passage defined in the filtration housing and providing selectable fluid communication between the inlet port and the outlet port;
 - a first filter disposed in the first circuit passage and adapted to filter debris from fluids flowed through the first circuit passage;
 - a second circuit passage defined in the filtration housing and providing selectable fluid communication between the inlet port and the outlet port;
- and
 - a flow path selection means disposed within the filtration housing and adapted to selectively direct flow either into the first circuit passage or into the second circuit passage.
2. The apparatus of Claim 1 further comprising:
 - a second filter disposed in the second circuit passage and adapted to filter debris from fluids flowed through the second circuit passage.
3. The apparatus of Claim 1, wherein the flow path selection means comprises:
 - a diverter valve.

4. The apparatus of Claim 3, wherein the diverter valve comprises:
 - a ball valve.
5. A refrigerant filtration apparatus comprising:
 - a filtration housing having an inlet port and an outlet port, each port adapted for connection to an air-conditioning refrigerant system adapted to provide refrigerant flow;
 - a primary circuit passage defined in the filtration housing and providing selectable fluid communication between the inlet port and the outlet port, the primary circuit passage comprising:
 - a primary filter channel having a primary filter channel inlet and a primary filter channel outlet; and
 - a primary filter disposed in the primary filter channel and adapted to filter debris from refrigerant flowed through the primary filter channel;
 - a secondary circuit passage defined in the filtration housing and providing selectable fluid communication between the inlet port and the outlet port, the secondary circuit passage comprising:
 - a secondary filter channel having a secondary filter channel inlet and a secondary filter channel outlet; and

a secondary filter disposed in the secondary filter channel and adapted to filter debris from refrigerant flowed through the secondary filter channel; and

a diverter valve disposed within the filtration housing and adapted to selectively direct refrigerant flow from the inlet port into either the primary filter channel inlet or the secondary filter channel inlet.

6. The apparatus of Claim 5, wherein the diverter valve is disposed adjacent to the inlet port and is operable between a first diverter valve position and a second diverter valve position,

wherein, the primary circuit passage and the secondary circuit passage are so adapted that placing the diverter valve in the first diverter valve position configures the diverter valve so as to direct refrigerant flow into the primary filter channel inlet and further configures the diverter valve to block refrigerant flow into the secondary filter channel inlet, and

wherein, the primary circuit passage and the secondary circuit passage are so adapted that placing the diverter valve in the second diverter valve position configures the diverter valve so as to direct refrigerant flow into the secondary filter channel inlet and further configures the diverter valve to block refrigerant flow into the primary filter channel inlet.

7. The apparatus of Claim 6, the primary filter comprising a primary filter body defining a primary filter interior region for retaining debris, the

primary filter disposed in the primary filter channel so that refrigerant flowed along the primary filter channel is flowed into the primary filter interior region, through the primary filter body and back into the primary filter channel,

wherein, the primary circuit passage and the secondary circuit passage are so adapted that placing the diverter valve in the second diverter valve position entraps debris retained in the primary filter interior region between the diverter valve and the primary filter body.

8. The apparatus of Claim 5, further comprising:

an orifice tube disposed in the secondary circuit passage at a position downstream of the secondary filter.

9. A method of filtering entrained debris from the refrigerant of an air conditioning refrigerant system, the method comprising the steps of:

(a) providing an air conditioning refrigerant system, the refrigerant system comprising a high pressure side including a compressor, a condenser and a flow reducing device and further comprising at least one replacement component,

(b) providing a refrigerant filtration apparatus comprising:
a filtration housing having an inlet port and an outlet port, each port adapted for connection to an air-conditioning refrigerant system adapted to provide refrigerant flow;

a primary circuit passage defined in the filtration housing and providing selectable fluid communication between the inlet port and the outlet port, the primary circuit passage comprising:

a primary filter channel having a primary filter channel inlet and a primary filter channel outlet; and
a primary filter disposed in the primary filter channel and adapted to filter debris from refrigerant flowed through the primary filter channel;

a secondary circuit passage defined in the filtration housing and providing selectable fluid communication between the inlet port and the outlet port, the secondary circuit passage comprising:

a secondary filter channel having a secondary filter channel inlet and a secondary filter channel outlet; and
a secondary filter disposed in the secondary filter channel and adapted to filter debris from refrigerant flowed through the secondary filter channel; and

a diverter valve disposed within the filtration housing and adapted to selectively direct refrigerant flow from the inlet port into either the primary filter channel inlet or the secondary filter channel inlet;

- (c) installing the refrigerant filtration apparatus in the refrigerant system high pressure side;
- (d) positioning the diverter valve so as to direct refrigerant flow to the primary circuit passage;
- (e) operating the air-conditioning refrigeration system until a shifting parameter is observed; and
- (f) shifting the diverter valve position so as to direct refrigerant flow to the secondary circuit passage.

10. The method of Claim 9, wherein the shifting parameter comprises elapsed time of operation of the air-conditioning refrigerant system after reaching normal operating temperatures, wherein step (e) further comprises:

- operating the air-conditioning refrigeration system for a sufficient time for the refrigerant system to reach normal operating temperatures; and
- operating the air-conditioning refrigeration system for between about fifteen minutes and about three hours after reaching normal operating temperatures.

11. The method of Claim 10, wherein step (e) further comprises

- operating the air-conditioning refrigeration system for about one hour after reaching normal operating temperatures.

12. The method of Claim 9, wherein step (c) further comprises;

installing the refrigerant filtration apparatus downstream of the condenser.

13. The method of Claim 9, wherein the shifting parameter comprises total elapsed time of operation of the air-conditioning refrigerant system, wherein step (e) further comprises:

operating the air-conditioning refrigerant system for between about one half hour and about four hours of total elapsed time of operation.

14. The method of Claim 9, wherein the shifting parameter comprises differential pressure across the primary filter, wherein step (e) further comprises:

operating the air-conditioning refrigerant system until a differential pressure across the primary filter of between about 5 p.s.i.g. and about 20 p.s.i.g. is observed.